

U.S. Army Corps of Engineers' Response to Regulator and Community Stakeholder Concerns regarding 2001 Soil Sampling for Possible Contaminants remaining from World War I-Era Chemical Warfare Research Activities at American University Experiment Station

1 Purpose

In recent months, several regulator and community stakeholder concerns have been expressed regarding soil sampling conducted by the U.S. Army Corps of Engineers (USACE) in early 2001 as part of the Spring Valley Formerly Used Defense Site (FUDS) investigation. This specific effort, referred to as the American University Experiment Station (AUES) List sampling, involved the analysis of soil for a variety of chemicals suspected of being used at AUES as part of the US Army's chemical warfare research from 1917 to 1920. This document addresses the identified concerns by describing the circumstances surrounding the planning and execution of the AUES List sampling and how the results were shared with various stakeholders.

2 Stakeholder Concerns

On January 14, 2003 USACE representatives and the US Environmental Protection Agency (USEPA) Region 3 remedial project manager met with the property owner of 3819 48th Street to discuss his individual concerns regarding the Spring Valley investigation and characterization of his property. During this meeting, the AUES List soil sampling results for this property were shared with the owner, unbeknownst to the USACE representatives that the owner had not seen these results previously. Though surprised, the owner appeared relieved to receive the data and to learn from USACE that the results did not contain any significant findings or reason for additional investigation.

In the days following this meeting, the property owner forwarded the data results to Washington DC's Department of Health (DC DOH). Data results for 3819 48th Street and the other three properties included in this sampling, referred to as the Operable Unit 4 (OU4) AUES residential properties, were discussed at the January 2003 Spring Valley Partnership meeting between USACE, USEPA and DC Health. During this meeting, the DC DOH representative expressed several concerns regarding USACE actions, alleging that DC DOH was not aware of the sampling and that DC DOH had not been furnished with the final report of the sampling effort dated May 2002. The following month, DC DOH released its *Draft Comments on the Corps of Engineers' Final Report of Analytical Results dated May 8, 2002 for 3819 48th Street; 4710 Quebec Street; 4625 Rockwood Parkway, and 4633 Rockwood Parkway (Appendix 1)*. Subsequently, in the Spring of 2003, the 2001 AUES List sampling event and management of the data results became the focus of several Spring Valley Restoration Advisory Board (RAB) discussions and local press articles.

The DC DOH comments and related concerns expressed by the property owners/residents can be grouped into the following major issues:

- *USACE did not inform the regulators or the property owners about the sampling event*
- *USACE did not have permission to conduct the AUES sampling on at least two of the residential properties investigated*
- *The process for validating the data was unusually long and inadequate*

- *Sampling results were not shared with the regulatory agencies or property owners*
- *The compounds detected may present a significant risk to those living on the properties*
- *Uncertainties associated with compounds that could not be analyzed for may present a significant risk to those living on the properties.*
- *Additional investigations, including resampling, should be conducted on the four OU4 AUES residential properties.*

USACE believes that the AUES List sampling was an appropriate effort to determine if a broader AUES List investigation was necessary. Records indicate USACE had permission from the property owners to conduct this sampling. Additionally, USACE records indicate that both DC DOH and USEPA were involved in the planning of the AUES List sampling and were provided results in a timely manner. Most importantly, USACE, USEPA and DC DOH all agree that the AUES List sampling results currently do not indicate the presence of any chemicals posing significant risks to those living on the OU4 AUES residential properties, a conclusion shared publicly during a recent Spring Valley RAB meeting.

USACE does acknowledge that the data results and the absence of significant risk for these four properties should have been shared with the property owners in a more timely manner and apologized for this community outreach oversight during meetings with the OU4 AUES residential property owners and the RAB. Actions are underway to ensure that such oversights do not occur in the future. Additionally, USACE also recognizes the present of uncertainties within the data results from the AUES List sampling and is working with the regulator and community stakeholders to evaluate and address these uncertainties to the greatest extent practicable.

Support for these conclusions and the ongoing efforts to move the AUES List sampling issue forward collectively are provided in the remainder of this document and the attached appendices.

3 Investigation Background

USACE conducted the AUES List sampling at ten locations within the Spring Valley project, including: the Child Development Center and Lot 12 on the campus of American University (the AU properties); four residential properties associated with the Sedgwick Trench on the 5000 block of Sedgwick Street, NW (the Sedgwick AUES residential properties); and four residential properties located in OU4 to the south and east of the AU campus (the OU4 AUES residential properties). The purpose of the sampling was to determine whether contaminants other than arsenic were present at levels whereby additional investigation on more properties would be warranted.

To fully understand the AUES List sampling, it is important to view it in the larger context of the Spring Valley soil investigation. Specifically, the AUES List sampling was part of a tiered approach involving a focused, small scale evaluation of a large suite of potential contaminants, a medium scale investigation targeting a more refined list of potential AUES contaminants, and a large scale characterization of the identified contaminant of concern (arsenic). These three tiers of soil investigation conducted in Spring Valley to date are delineated as follows:

Tier 1 – The AUES List sampling and analysis was conducted for a **broad suite of compounds and analytes on approximately 10 properties/locations.**

Tier 2 – Within the Operable Unit 5 (OU5) investigation initiated in 2001, **approximately 301 properties received soil boring analysis for explosives and/or chemical warfare agents and their degradation products.** The purpose of this investigation was to determine if AUES-specific contaminants were present in areas classified as points of interest (POI), where historical records suggested past activity most likely took place. Since historical records are rarely complete, 15% of the Spring Valley project area properties not associated with a POI was also sampled for these specific AUES-related constituents.

Tier 3 – Also within the OU5 investigation, **all residential properties and business lots (approximately 1500) for which rights of entry (ROEs) were obtain were sampled and analyzed for soil arsenic contamination.** Arsenic was initially identified as a contaminant of concern during OU3 work at the Korean Ambassador's residence located at 4801 Glenbrook Road, NW. Approximately 10 % or 150 properties have since been identified as needing soil removal.

This approach was a logical and cost-effective effort to evaluate comprehensively the nature and extent of soil contamination resulting from AUES activities throughout Spring Valley. These sampling efforts were well-coordinated with DC Health and EPA Region 3, and identified arsenic as the only soil contaminant of concern to date.

With the investigative approach delineated, it is now possible to address the timeline by which these efforts unfolded, resulting in the most recent DC DOH draft comments.

4 Sequence of Events

DC DOH draft comments refer to significant time delays between sample collection, data validation and notification of regulators and affected residents/owners. However, DC DOH and EPA Region 3 were fully aware of AUES List sampling at AU, at the four Sedgwick AUES residential properties, and the four OU4 AUES residential properties. As outlined in **Appendix 2** of this response document, clear efforts were made by USACE to provide the regulatory agencies opportunities for input into the planning, and to incorporate regulator requests into the final work plans. Additionally, records indicate that USACE shared the data results with its regulatory partners in a timely manner.

Specific regulator and resident concerns revolve around the 2-year length of time that has transpired between sample collection and final data publication. Table 1 provides a timeline of the sequence of events, which is supported by USACE records.

Table 1 reveals USACE efforts to conduct an open and responsive investigation. As discussed with the Spring Valley Restoration Advisory Board in March 2003 (**Appendix 2, Attachment A**), there are several ongoing facets of the Spring Valley project that require attention during any given time frame, with priorities and project plans shifting as new discoveries are made and additional requests from regulators and community members are received. In the case of the AUES Sampling results, project efforts to resolve uncertainties and to release the data for public comment were given a lower priority and pushed back as USACE implemented area-wide arsenic sampling, executed the TCRA, and initiated the second round of TCRA based on regulator comments. Such delay was only acceptable to the USACE because no significant risks to community members were identified by USACE or its regulatory partners during initial review.

Throughout the project, USACE has made a committed effort to keep property owners informed of upcoming sampling and subsequent data results with regard to arsenic contamination, the only contaminant of concern identified to date in Spring Valley. For instance, as shown in **Appendix 2 (Attachments M and N)**, preliminary arsenic results were sent to the OU4 residents to keep them informed in a timely manner, noting that final results were then sent a few months later. As the project expanded significantly into OU5 in the summer of 2001, preliminary arsenic data could no longer be mailed to residents. However, validated results were provided over the phone if requested, in order to meet immediate resident needs or concerns until the formal letter with the final results could be produced. Additionally, validated data were placed in the Information Repository at the Palisade Library for broader public use.

Table 1: 2001 AUES List Sampling Timeline

Nov – Feb 2001	Partnership planning of AUES List sampling
Feb – Apr 2001	Soil samples collected
May – July 2001	Validated data shared with regulators
Aug 2001 – Jan 2002	Work on acceptable data reporting approach using AU results as a test case
Feb – April 2002	Finalize reports for OU4 AUES List sampling for all AUES List sampling
May – July 2002	Plan and initiate Time Critical Removal Action (TCRA); Simultaneously discuss reporting and uncertainty issues with DC DOH and USEPA in preparation for Fall 2002 Public Comment release of Engineering Evaluation and Cost Analysis (EE/CA) in support of Non-Time Critical Removal Action
Aug – Oct 2002	Address DC DOH request for second tier of TCRA removals; EE/CA and Non-Time Critical Removal Action delayed until TCRA is completed
Nov 2002 – June 2003	Conduct and complete second round of TCRA; Release of EE/CA and AUES List sampling results scheduled for July 2003

Unlike the arsenic results, data for the wide-array of compounds investigated through the AUES List sampling are quite complicated and could not be easily put in layman's terms and distributed by simple letter. Also, during the AUES List data evaluation process, soil arsenic delineation and removal was the highest priority, receiving a significant portion of the available funding and personnel. In turn, the project management team decided to develop an adequate reporting process for the AUES List data results as time allowed, instead of releasing the data for full public consumption without the necessary supporting materials and conclusions. While other ongoing work facilitated the private exchange of the AUES List sampling results with AU and the

Sedgwick AUES owners/residents until the official reports could be released, the four OU4 residents did not receive this same courtesy.

In early 2001, USACE did vastly expand its community outreach efforts to manage the many owner/residents concerns that would naturally arise during the broad, OU5 arsenic sampling investigation. However, the small-scale AUES list sampling unfortunately fell outside the focused community outreach efforts at that time. Realizing this oversight with regard to the four OU4 AUES residential properties, USACE has acknowledged openly to the OU4 property owners and Spring Valley RAB that it would have been appropriate to share the data sooner. Even if the reports would not be released for some time, USACE could have sent brief letters explaining that a) the sampling results had been reviewed and b) they did not indicate any other contaminants of concern. Efforts to remedy the resulting misunderstandings and questions are ongoing and discussed in more detail in Section 8 of this document.

5 Property Access

Some stakeholders have questioned whether ROEs for the AUES List sampling effort were obtained for two of the four OU4 properties. It is USACE's regular process to obtain the necessary ROE prior to accessing any property in support of the Spring Valley investigation, and the process for the AUES List sampling in 2001 was no different. **Attachments O, P, Q and R in Appendix 3** contain the ROEs for the four properties that received the AUES List sampling. Other included attachments reveal USACE's proactive efforts to communicate verbally and/or in writing with the property owners prior to executing the AUES List sampling.

Related to the issue of access, some question has been raised by one or two property owners regarding whether they provided permission to analyze for the AUES list of compounds. In response, it is important to note that the ROE is a legal mechanism to provide access to a property, and is not utilized to gain property owner permission for specific laboratory analysis. While efforts were made by USACE to inform residents of sampling plans, the specific type of laboratory analyses executed for a property is an investigative judgment decision to be made by USACE and the participating regulatory agencies. Both DC DOH and EPA participated fully in this decision process, as previously described.

6 Data Quality

In response to data quality concerns, USACE notes that the data were validated in accordance with EPA Region 3 modifications to the National Functional Guidelines for data validation. The validation covered all information contained in the data packages, including sample results, laboratory quality control results, chain-of-custody forms, and all supporting raw data. No major data quality control issues were noted during the review of the data by USACE's remedial contractor, Parsons Engineering Science, Inc.

In response to DC DOH's request for the laboratory reports and data packages for the OU4 AUES sampling, Parsons sent copies of the data packages to DC DOH and EPA on 26 February 2003. As part of the regulatory oversight process, EPA Region 3 conducted an independent validation of the data. Two validation reports were generated by the EPA's lab, identifying only two inorganics (antimony and phosphate) and two organics (acrolein and benzyl bromide) out of all the compounds analyzed for as major problems. At the present time, USACE holds a different perspective regarding the validation findings and does not believe the problems identified are major. The EPA's reports have been distributed to the participating agencies, community RAB

members and the affected property owners for review. Currently, a working meeting to discuss these reports and any necessary next steps is targeted for July.

7 AUES List Data Assessment

Several regulator and community concerns have been expressed regarding the number and variety of compounds detected during the AUES List sampling and the potential health effects associated with these compounds. Concerns expressed by DC DOH or the involved residents revolve around a) potential sources of the compounds detected, b) the toxicity of individual compounds and c) potential synergistic effects from exposure to multiple compounds.

Contaminant Sources - The DC DOH comments provide a detailed list of compounds detected through the AUES List sampling, but make no distinctions between chemicals that are likely present as a result of AUES activities, those chemicals that are natural constituents of soil (e.g., nitrate, phosphate, sulfate), and chemicals that are expected to be present in an urban residential neighborhood (e.g., hydrocarbons, polycyclic aromatic hydrocarbons). Upon closer review, it is clear that virtually all of the compounds detected through the AUES List sampling are either used extensively in industry, are commonly found in the urban environment or are potentially of natural origin. Furthermore, many of the compounds detected on the OU4 residential properties are only tentatively identified, and some of the identified compounds are likely analytical artifacts (false positives).

Additionally, draft DC DOH comments also suggest that some of the detected compounds are experimental chemical warfare agents or precursor compounds and that many of these compounds are unknown in modern industry. However, USACE's review indicates that none of the 23 compounds listed in Tab B of the DC DOH comments are experimental chemical warfare agents and only two are potential precursor compounds.

Toxicity - The draft DC DOH comments circulated to property owners list the compounds detected, but do not describe the concentrations of the chemicals found. By not considering the concentrations of the compounds detected, DC DOH comments, in turn, fail to note that most of the reported concentrations are less than EPA Region 3's Risk-Based Concentrations (RBCs) for screening residential property. Considering the available RBCs, it is clear that the detected concentrations found on the OU4 AUES residential properties correspond to a *de minimis* risk and do not pose any health risks of concern for those individuals residing on the four properties sampled. As discussed with the affected property owners, USACE, EPA Region 3 and DC Health are in agreement on this issue.

In presenting risk concerns, the DC DOH comments (Tab B) note that many of the chemicals on the AUES list are "toxic" and cites various published sources of toxicity information. However, the DC DOH comments mischaracterize and misinterpret the content of the cited references in many places. Furthermore, the comments fail to recognize the first tenet of toxicology—the dose makes the poison. For example, the DC DOH comments state that oleic acid is a "poison and skin irritant"; they fail to note that oleic acid is found in percentage amounts in olive oil. While pure oleic acid applied to the skin is likely to cause irritation, this fact is not relevant to the concentrations detected in soil at any of the OU4 properties. The DC DOH notation of "toxic" and "poison" in Tab B fails to capture the context in which these chemicals are detected. Specific comments on the chemicals listed as "toxic" in the DC DOH report are provided in **Appendix 4**.

USACE does recognize that certain compounds detected do not have RBCs. Such inherent limitations are part of any scientific investigation and must be dealt with to the greatest extent practicable. USACE is working with DC DOH, USEPA and concerned residents in trying to reduce these and other identified uncertainties, which is discussed in more detail in the last section of these responses.

Risk Assessment - DC DOH comments state that the number of compounds on any given property makes it difficult, if not impossible, to assess the risk. USACE acknowledges that potential synergistic, antagonistic, or additive effects of multiple chemicals can complicate risk assessment in locations where large numbers of chemical compounds are found, and continues to work with DC DOH and USEPA in trying to address such risk uncertainties. However, while scientific research is ongoing to develop methodologies for assessing risk from complex mixtures, it is equally important to acknowledge that the potential for future advances does not mean current risk assessment practices are invalid.

USACE does follow currently appropriate regulations and guidance when evaluating risks. For instance when screening the AUES List data, USACE followed EPA Region 3 guidance indicating that the effects of multiple chemicals are accounted for by adjusting the non-carcinogenic RBCs down by an order of magnitude. In other words, if the RBC for a non-carcinogen was 5.2 mg/kg, USACE compared the concentration detected in the soil at the OU4 properties to 0.52 mg/kg. It remains USACE's commitment that any risk assessment evaluating the AUES data will be performed using the best practices available at the time, and that both DC DOH and USEPA will have full opportunity to provide regulatory review and comment to any such risk assessment.

USACE notes that EPA has prepared two risk assessments for the Spring Valley area, one in 1999 and one in 2000. The DC DOH comments suggest that a new risk assessment should be done using newer data from site-wide arsenic sampling and limited sampling for other constituents, if EPA feels that the additional limited data should be included. However, it is important to note that the purpose of OU4 AUES residential properties study was to examine whether certain additional chemicals should be added to the assessment, and the results to date indicate that chemicals other than arsenic appear to pose little, if any, additional risk. While any decision to update or append the earlier two risk assessments is a decision for EPA Region 3, USACE does not see any value in revising these earlier risk assessments because of the low concentrations of the other constituents detected and because a response action to address the arsenic contamination is already underway.

8 Future Project Efforts

Several concerns have been expressed by DC DOH and the affected OU4 residents with regard to the need for additional investigations on the four OU4 properties sampled previously. Specifically, DC DOH recommends that the Partners discuss the need for more extensive sampling and whether soil-gas mapping would be useful to identify potential burial sites. DC DOH recommends examining the remaining two properties geophysically for potential burial sites, and suggests that the detection of volatile organic compounds in a location might indicate a containerized burial site.

USACE does not believe that the types and concentrations of volatile and semivolatile organic compounds found in the soil on the OU4 AUES residential properties are indicative of the presence of a containerized burial site. However, it should be noted that three of the OU4

residential properties are slated to be surveyed geophysically to determine the presence of subsurface anomalies that could possibly be buried munition items, pits, or trenches based on a property prioritization plan developed in collaboration with DC DOH and USEPA and reviewed with the Spring Valley RAB. Progress on these ongoing geophysical investigations will continue to be one of the priorities discussed at monthly partnering meetings between USACE, EPA Region 3 and DC DOH.

In conjunction with the OU4 AUES sampling, USACE has established a work group with regulatory agencies and the affected OU4 AUES property owners/residents to review the AUES sampling results, identify uncertainties and discuss potential next steps. Whether or not additional AUES sampling will be necessary in the future will be evaluated through this multi-stakeholder work group. Minutes from the first meeting of this group are available on the project's web site at <http://www.nab.usace.army.mil/projects/WashingtonDC/springvalley.htm>. Additionally, it should be noted that 85 questions have been submitted by community RAB members regarding this sampling event, and that responses to these questions have been completed in consultation with USEPA and DC DOH and also will be available through the Spring Valley web site. USACE will continue to post the status and progress of efforts to address AUES List sampling uncertainties, as it becomes available.

These continued efforts regarding the AUES List findings and uncertainties will be integrated with the several other ongoing project priorities. Included in these project priorities is a multi-year removal action for addressing the 150 properties requiring soil arsenic removal, as well as several ongoing or planned investigations into other potential contamination and environmental media (i.e., potential buried ordnance, indoor air and groundwater).